

What is claimed:

1           1.     An intervertebral implant comprising:  
2                 a first part that is adapted to mate with a first vertebra;  
3                 a second part that is adapted to mate with a second vertebra;  
4                 and  
5                 a third part that mates with the first part and the second part,  
6                 with the third part having a first curved surface that mates with the first  
7                 part and a second curved surface that mates with the second part and  
8                 with the first curved surface directed oppositely to and provided at an  
9                 angle to the second curved surface.

1           2.     The implant of claim 1 wherein:  
2                 the first part has a first socket that receives the first curved  
3                 surface and the second part has a second socket that receives the  
4                 second curved surface.

1           3.     The implant of claim 1 wherein the first part has a first keel that  
2                 is adapted to be inserted in a first vertebra and the second part has a second  
3                 keel that is adapted to be inserted in a second vertebra.

1           4.     The implant of claim 1 wherein the first curved surface allows  
2                 the implant to move between anterior and posterior directions and the second  
3                 curved surface allows the implant to move laterally.

1           5.     The implant of claim 3 wherein the first and second keels are  
2                 about parallel to a first axis of movement of one of the first part and the  
3                 second part about the third part and the first and second keels are about  
4                 perpendicular to a second axis of movement of the other of the first part and  
5                 the second part about the third part.

1           6.     The implant of claim 5 wherein:

2           the first part has a first socket that receives the first curved  
3 surface and the second part has a second socket that receives the  
4 second curved surface.

1       7.     An intervertebral implant comprising:  
2           a first part that is adapted to mate with a first vertebra;  
3           a second part that is adapted to mate with a second vertebra;  
4       and  
5           a third part that mates with the first part and the second part with  
6 the third part having a first convex surface that mates with the first part  
7 and a second convex surface that mates with the second part and with  
8 the first convex surface directed oppositely to and provided at an angle  
9 to the second convex surface.

1       8.     The implant of claim 7 wherein:  
2           the first part has a first socket that receives the first convex  
3 surface and the second part has a second socket that receives the  
4 second convex surface.

1       9.     The implant of claim 7 wherein the first part has a first keel that  
2 is adapted to be inserted in a first vertebra and the second part has a second  
3 keel that is adapted to be inserted in a second vertebra.

1       10.    The implant of claim 7 wherein the first convex surface allows  
2 the implant to move between anterior and posterior directions and the second  
3 convex surface allows the implant to move laterally.

1       11.    The implant of claim 9 wherein the first and second keels are  
2 about parallel to a first axis of movement of one of the first part and the  
3 second part about the third part and the first and second keels are about  
4 perpendicular to a second axis of movement of the other of the first part and  
5 the second part about the third part.

1           12.    The implant of claim 11 wherein:  
2                   the first part has a first socket that receives the first convex  
3           surface and the second part has a second socket that receives the  
4           second convex surface.

1           13.    An intervertebral implant comprising:  
2                   a first plate adapted to mate to a first vertebral body, the first  
3           plate including a first socket having a first interior surface wherein the  
4           first interior surface has a curved shape and a first wall and a second  
5           wall;  
6                   a second plate adapted to mate to a second vertebral body, the  
7           second plate including a second socket having a second interior  
8           surface; and  
9                   a spacer with a first side that fits adjacent the first interior  
10          surface of the first socket and a second side that fits adjacent the  
11          second interior surface of the second socket.

1           14.    The implant of claim 13 including at least one of the first and  
2           second plates including a keel extending therefrom and adapted to engage a  
3           vertebral body.

1           15.    The implant of claim 13 including a first keel extending from the  
2           first plate and adapted to engage a first vertebral body, and a second keel  
3           extending from the second plate and adapted to engage a second vertebral  
4           body.

1           16.    The implant of claim 13 wherein the first plate has a first side  
2           and a second side, wherein the first side faces the second plate and the  
3           second side contacts a surface of the first vertebral body.

1           17.    The implant of claim 16 wherein the first side of the first plate  
2           and the second side of the first plate are parallel to each other.

1           18.    The implant of claim 16 wherein the first side of the first plate  
2           and the second side of the first plate are not parallel to each other.

1           19.    The implant of claim 13 wherein the second plate has a first side  
2           and a second side and the first side of the second plate faces the first plate  
3           and the second side of the second plate contacts a surface of the second  
4           vertebral body.

1           20.    The implant of claim 19 wherein the first side of the second plate  
2           and the second side of the second plate are parallel to each other.

1           21.    The implant of claim 19 wherein the first side of the second plate  
2           and the second side of the second plate are not parallel to each other.

1           22.    The implant of claim 13 wherein the first socket of the first plate  
2           has first and second side walls that are parallel to each other.

1           23.    The implant of claim 13 wherein the second socket of the  
2           second plate has first and second side walls that are parallel to each other.

1           24.    The implant of claim 13 wherein the first and second side walls  
2           of the first plate are parallel to each other and the second socket of the  
3           second plate has first and second side walls that are parallel to each other  
4           and further wherein the first and second side walls of the first plate are  
5           perpendicular to the first and second side walls of the second plate.

1           25.    The implant of claim 13 wherein the implant is assembled so  
2           that the spacer is positioned within the socket of the first plate and the socket  
3           of the second plate.

1           26.    The implant of claim 13 wherein the first side of the spacer is  
2           curved and the second side of the spacer is curved.

1           27.    The implant of claim 26 wherein the first curved side is oriented  
2 perpendicular to a curve of the second curved side.

1           28.    The implant of claim 13 wherein the first side of the spacer is  
2 convex and the second side of the spacer is convex.

1           29.    The implant of claim 28 wherein the convex first side is oriented  
2 perpendicular to the convex second side.

1           30.    The implant of claim 13 wherein the socket of the first plate has  
2 first and second side walls that are substantially perpendicular to the first  
3 surface of the first plate.

1           31.    The implant of claim 13 wherein the socket of the second plate  
2 has first and second side walls that are substantially perpendicular to the first  
3 surface of the second plate.

1           32.    An intervertebral implant comprising:  
2                a first plate adapted to mate to a first vertebral body, the first  
3 plate including a first socket having a first interior surface;  
4                a second plate adapted to mate to a second vertebral body, the  
5 second plate including a second socket having a second interior  
6 surface wherein the second interior surface has a curved shape and a  
7 first wall and a second wall; and  
8                a spacer with a first side that fits adjacent the first interior  
9 surface of the first socket and a second side that fits adjacent the  
10 second interior surface of the second socket.

1           33.    The implant of claim 32 including at least one of the first and  
2 second plates including a keel extending therefrom and adapted to engage a  
3 vertebral body.

1           34.    The implant of claim 32 including a first keel extending from the  
2 first plate and adapted to engage a first vertebral body, and a second keel  
3 extending from the second plate and adapted to engage a second vertebral  
4 body.

1           35.    The implant of claim 32 wherein the first plate has a first side  
2 and a second side, wherein the first side faces the second plate and the  
3 second side contacts a surface of the first vertebral body.

1           36.    The implant of claim 35 wherein the first side of the first plate  
2 and the second side of the first plate are parallel to each other.

1           37.    The implant of claim 35 wherein the first side of the first plate  
2 and the second side of the first plate are not parallel to each other.

1           38.    The implant of claim 32 wherein the first plate has a first side  
2 and a second side and the first side of the first plate faces the second plate  
3 and the second side of the first plate contacts a surface of the first vertebral  
4 body.

1           39.    The implant of claim 30 wherein the first socket of the first plate  
2 has first and second side walls.

1           40.    The implant of claim 38 wherein the first and second side walls  
2 of the first plate are parallel to each other within the socket.

1           41.    The implant of claim 32 wherein the socket of the first plate has  
2 first and second side walls that are substantially perpendicular to the first  
3 surface of the first plate.

1           42.    The implant of claim 32 wherein the socket of the second plate  
2 has first and second side walls that are substantially perpendicular to the first  
3 surface of the second plate.

1           43.    The implant of claim 32 wherein the first socket of the first plate  
2   has first and second side walls that are parallel to each other and the first and  
3   second side walls of the second socket are parallel to each other and further  
4   wherein the first and second side walls of the first plate are perpendicular to  
5   the first and second side walls of the second plate.

1           44.    The implant of claim 32 wherein the implant is assembled so  
2   that the spacer is positioned within the socket of the first plate and the socket  
3   of the second plate.

1           45.    The implant of claim 32 wherein the first plate has a first side  
2   and a second side and the first side of the first plate faces the second plate  
3   and the second side of the first plate contacts a surface of the second  
4   vertebral body.

1           46.    The implant of claim 45 wherein the first side of the second plate  
2   and the second side of the second plate are parallel to each other.

1           47.    The implant of claim 45 wherein the first side of the second plate  
2   and the second side of the second plate are not parallel to each other.

1           48.    The implant of claim 32 wherein the first side of the spacer is  
2   curved and the second side of the spacer is curved.

1           49.    The implant of claim 48 wherein a curve of the first curved side  
2   is perpendicular to a curve of the second curved side.

1           50.    The implant of claim 32 wherein the first surface of the spacer is  
2   convex and the second surface of the spacer is convex.

1           51.    The implant of claim 50 wherein the first convex surface is  
2   oriented to lie perpendicular to the second convex surface.

1           52.    An intervertebral implant comprising:  
2                a first plate adapted to mate to a first vertebral body;  
3                a second plate adapted to mate to a second vertebral body; and  
4                a spacer with a first convex side and a second convex side and  
5           further wherein the first convex side is perpendicular to the second  
6           convex side.

1           53.    The implant of claim 52 including at least one of the first and  
2           second plates including a keel extending therefrom and adapted to engage a  
3           vertebral body.

1           54.    The implant of claim 52 including a first keel extending from the  
2           first plate and adapted to engage a first vertebral body, and a second keel  
3           extending from the second plate and adapted to engage a second vertebral  
4           body.

1           55.    The implant of claim 52 wherein the first plate has a first side  
2           and a second side, wherein the first side faces the second plate and the  
3           second side contacts a surface of the first vertebral body.

1           56.    The implant of claim 52 wherein a socket of the first plate has  
2           first and second side walls that are parallel to each other.

1           57.    The implant of claim 52 wherein a first socket of the first plate  
2           has first and second side walls that are perpendicular to a first surface of the  
3           second plate.

1           58.    The implant of claim 57 wherein a first socket of the first plate  
2           has a curved third side between the first and second side walls.



1           59.    The implant of claim 52 wherein the second plate has a first side  
2   and a second side, wherein the first side faces the first plate and the second  
3   side contacts a surface of the second vertebral body.

1           60.    The implant of claim 59 wherein the first side of the second plate  
2   and the second side of the second plate are parallel to each other.

1           61.    The implant of claim 59 wherein the first side of the second plate  
2   and the second side of the second plate are not parallel to each other.

1           62.    The implant of claim 59 wherein the second socket of the  
2   second plate has first and second side walls that are parallel to each other.

1           63.    The implant of claim 59 wherein a socket of the second plate  
2   has first and second side walls that are perpendicular to the first surface of the  
3   second plate.

1           64.    An intervertebral implant comprising:  
2           a first plate adapted to mate with a first vertebra;  
3           a second plate adapted to mate with a second vertebra;  
4           a spacer placed between the first and the second plates;  
5           the spacer having first and second curved surfaces that are at an angle  
6   to each other with the first curved surface mated with the first plate and the  
7   second curved surface mated with the second plate.

1           65.    The implant of claim 64 wherein the curved surfaces are  
2   cylindrical.

1           66.    The implant of claim 64 wherein the curved surfaces are convex.

1           67.    The implant of claim 64 wherein the first and second plates each  
2   have a curved surface that mates with a curved surface of the spacer.

1           68.    The implant of claim 65 wherein the first and second plates each  
2   have a cylindrical surface that mates with a cylindrical surface of the spacer.

1           69.    The implant of claim 66 wherein the first and second plates each  
2   have a concave surface that mates with a convex surface of the spacer.

1           70.    The implant of claim 64 wherein the first curved surface has a  
2   first axis and the second curved surface has a second axis, and the first axis  
3   and the second axis are at an angle to each other.

1           71.    The implant of claim 64 wherein the first curved surface has a  
2   first axis and the second curved surface has a second axis, and the first axis  
3   and the second axis are at about perpendicular to each other.

1           72.    An intervertebral implant comprising:  
2       a first plate adapted to mate with a first vertebra;.  
3       a second plate adapted to mate with a second vertebra;  
4       a spacer placed between the first and the second plates; and  
5       wherein said spacer in conjunction with the first plate allows rotational  
6   motion about a first axis and blocks motion about a second axis, and the  
7   spacer in conjunction with the second plate allows rotational motion about the  
8   second axis and blocks motion about the first axis.

1           73.    The implant of claim 72 wherein said first axis is perpendicular  
2   to the second axis.

1           74.    The implant of claim 72 wherein the implant can rotate about a  
2   third axis that is at an angle to the first axis and to the second axis.

1           75.    The implant of claim 1 wherein said first curved surface is about  
2   perpendicular to the second curved surface.

1           76.    The implant of claim 7 wherein said first convex surface is about  
2 perpendicular to the second convex surface.

1           77.    The implant of claim 2 wherein at least one of the sockets has  
2 one or more crests.

1           78.    The implant of claim 2 wherein at least one of the sockets has  
2 one or more crests to allow for twisting motion between the first part and the  
3 second part.

1           79.    The implant of claim 8 wherein at least one of the sockets has  
2 one or more crests.

1           80.    The implant of claim 8 wherein at least one of the sockets has  
2 one or more crests to allow for twisting motion between the first part and the  
3 second part.

1           81.    The implant of claim 13 wherein at least one of the sockets has  
2 one or more crests.

1           82.    The implant of claim 13 wherein at least one of the sockets has  
2 one or more crests to allow for twisting motion between the first part and the  
3 second part.

1           83.    The implant of claim 1 wherein the third part is selected from  
2 the group consisting of polyetheretherketone, polyetherketoneketone,  
3 polyaryletheretherketone, polyetherketone, polyetherketoneetherketone-  
4 ketone, and polyetheretherketoneketone.

1           84.    The implant of claim 7 wherein the third part is selected from  
2 the group consisting of polyetheretherketone, polyetherketoneketone,

3 polyaryletheretherketone, polyetherketone, polyetherketoneetherketone-  
4 ketone, and polyetheretherketoneketone.

1 85. The implant of claim 13 wherein the spacer is selected from the  
2 group consisting of polyetheretherketone, polyetherketoneketone,  
3 polyaryletheretherketone, polyetherketone, polyetherketoneetherketone-  
4 ketone, and polyetheretherketoneketone.

1 86. The implant of claim 32 wherein the spacer is selected from the  
2 group consisting of polyetheretherketone, polyetherketoneketone,  
3 polyaryletheretherketone, polyetherketone, polyetherketoneetherketone-  
4 ketone, and polyetheretherketoneketone.